

Chapter 3 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

3.1 Traffic and Transportation/Pedestrian and Bicycle Facilities

3.1.1 Affected Environment

3.1.1.1 EXISTING ROADWAY NETWORK

Highway 101, which is a major north-south route along the western coast of the United States, passes through five Bay Area counties—Sonoma, Marin, San Francisco, San Mateo, and Santa Clara counties. It is the most heavily traveled route in the North Bay Area. In Sonoma County, Highway 101 plays a vital role in intra-county connections and also connects the County with the greater Bay Area.

According to Caltrans, the traffic along Highway 101 in the study corridor on an average day in 2003, represented by annual average daily traffic (AADT), ranged from 94,000 to 103,000 vehicles per day (both directions), as shown in Figure 3.1-1.¹ Immediately north of the Highway 101 / Wilfred Avenue Interchange, traffic volumes exceeded 120,000 vehicles per day (vpd).

The study area, which is illustrated in Figure 3.1-2, includes three full interchanges with important connecting roads: Petaluma Boulevard–Old Redwood Highway, SR 116 (Gravenstein Highway), and Rohnert Park Expressway. Local arterials and streets also serve the study area. The major streets in the study area are described below.

- **Old Redwood Highway** extends in a north-south direction east of Highway 101 through the cities of Petaluma, Cotati and Rohnert Park. It connects Petaluma Boulevard to the south with SR 116 in Cotati to the north. Old Redwood Highway provides two travel lanes in each direction in the cities of Petaluma and Cotati and one travel lane in each direction in unincorporated Sonoma County. It carries an Average Daily Traffic (ADT) volume of approximately 20,400 vpd between West Sierra Avenue–East Cotati Avenue and SR 116.
- **Stony Point Road** extends in a north-south direction west of Highway 101, connecting Petaluma Boulevard in the City of Petaluma to the south and SR 12 in the City of Santa Rosa to the north. Stony Point Road provides one lane of travel in both directions and carries an ADT of approximately 8,500 vpd at Pepper Road.

¹ <http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2003all.htm>

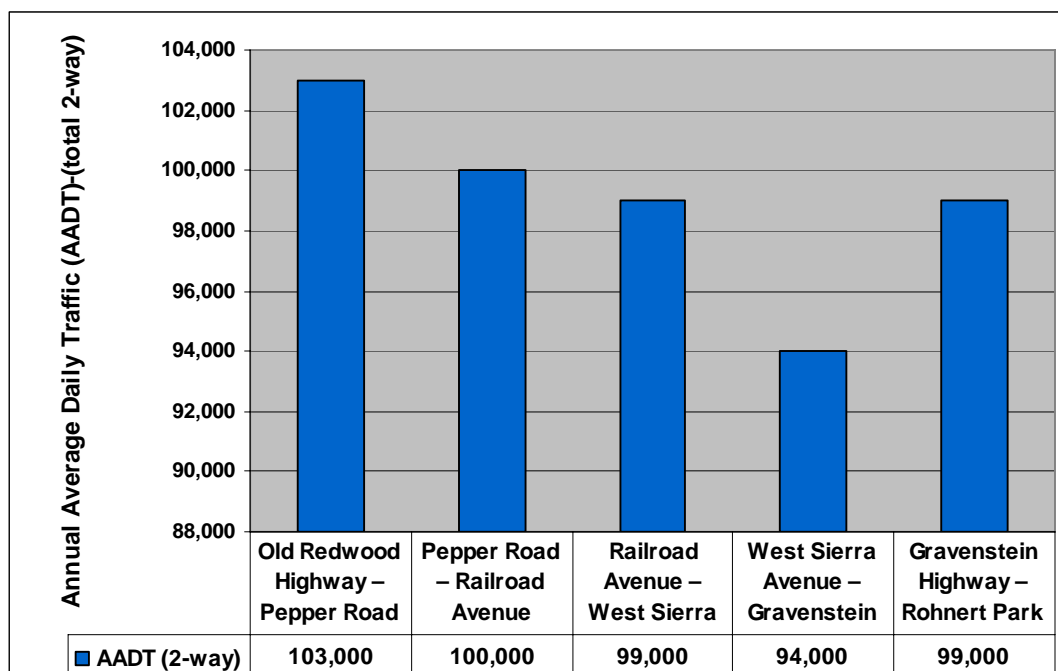


Figure 3.1-1: 2003 Annual Average Daily Traffic Volumes on Highway 101

- **Commerce Boulevard** runs in a north-south direction east of Highway 101 and connects Southwest Boulevard in Cotati to Golf Course Drive in Rohnert Park before turning west and crossing under Highway 101 to Redwood Drive. Commerce Boulevard provides two lanes of traffic in each direction between Enterprise Drive and Rohnert Park Expressway with an ADT of 18,000 vpd in this section.
- **Petaluma Boulevard** runs in a north-south direction starting at the Highway 101/Old Redwood Highway Interchange and re-connecting to Highway 101 south of Petaluma near the Petaluma River. Petaluma Boulevard provides two lanes of traffic in both directions reducing to one lane of traffic in each direction as it crosses to the east of the highway. Average daily traffic at the Highway 101 Interchange is approximately 20,000 vpd.
- **Railroad Avenue** extends in a northeast-southwest direction across Highway 101 through unincorporated Sonoma County, connecting Stony Point Road on the west to Petaluma Hill Road and continuing on to Davis Lane in the unincorporated area of Penngrove on the east. Within the study area, it provides one lane of travel in each direction and has an ADT of approximately 2,200 vpd.
- **West Sierra Avenue–East Cotati Avenue** runs in an east-west direction, crossing Highway 101 and traveling through the Cotati Hub. East of the Hub, it is named East Cotati Avenue and to the west it is West Sierra Avenue. In the study area, most of this street provides one lane of traffic in each direction with two lanes east of Lancaster Drive. Near Old Redwood Highway, the ADT is approximately 14,500 vpd.

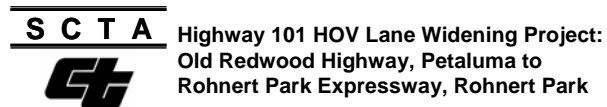


Figure 3.1-2

- **Gravenstein Highway (SR 116)** is a state highway that extends in an east-west direction connecting SR 12 in the City of Sebastopol on the west with Old Redwood Highway in the City of Cotati. Within the study area, SR 116 provides two lanes of traffic in each direction and serves approximately 22,750 vpd at its intersection with Highway 101.
- **Southwest Boulevard** extends in an east-west direction from Commerce Boulevard on the west to Snyder Lane on the east. Southwest Boulevard provides two lanes of traffic in each direction to carry approximately 13,100 vpd at Old Redwood Highway.
- **Rohnert Park Expressway** is a main east-west thoroughfare in the City of Rohnert Park and connects Stony Point Road on the west with Petaluma Hill Road on the east. Within the study area, Rohnert Park Expressway provides two lanes of traffic in each direction. At the Highway 101 / Rohnert Park Expressway Interchange, the ADT is approximately 26,300 vpd.

3.1.1.2 EXISTING TRAFFIC CONDITIONS ON HIGHWAY 101

Current peak hour traffic conditions on Highway 101 are discussed in this section. Although the project improvements focus on a 10.3-km (6.4-mi) stretch of Highway 101 from Old Redwood Highway to Rohnert Park Expressway (the project area), the proposed traffic improvements would affect traffic operations beyond these limits. Similarly, traffic conditions outside of the immediate project limits could affect traffic operations within the project area. For example, extremely congested conditions on northbound Highway 101, north of the project area, could build up congestion that extends south into the project area. Such congestion could induce long delays and disrupt the northbound traffic in the project area.

To include these kinds of effects, the traffic studies analyzed the stretch of Highway 101 all the way from Petaluma Boulevard South in Petaluma to Windsor River Road in Windsor. However, this environmental document reports traffic conditions only for the project area and immediate vicinity. This extended project area consists of Highway 101 from the Petaluma Boulevard South Interchange to the Rohnert Park Expressway Interchange, a distance of approximately 18.8 km (11.7 mi), which is referred to in this environmental document, as the “traffic study area”.² Figure 3.1-3 shows the location of the traffic study area.

Traffic counts for the traffic study area indicate that the morning peak hour for the northbound direction is typically between 8:00 and 9:00 a.m. and for the southbound direction is between 7:00 and 8:00 a.m. At most northbound locations, however, the hourly volumes recorded in the 7:00 to 8:00 a.m. period fall within 90 percent of the peak hour volumes. At most southbound locations, the volumes recorded in the two adjacent hours fall within 80 percent of the peak hour volumes.

² The traffic technical memorandum prepared for the project includes a larger “traffic study area” extending from Petaluma Boulevard South in Petaluma to Windsor River Road in Windsor because the traffic studies evaluated the effects of multiple projects.

The evening peak hour typically takes place between 4:00 and 5:00 p.m. for both the northbound and the southbound directions. The evening peak is as mildly pronounced as the morning peak, with volumes only slightly differentiated between 4:00 and 6:00 p.m. Although directional flow is somewhat evenly distributed by time of day, the small differences indicate that commute patterns are slightly more southward in the morning and slightly more northward in the evening. This reflects commute trips from bedroom communities in Sonoma County to jobs in Marin County and farther south.

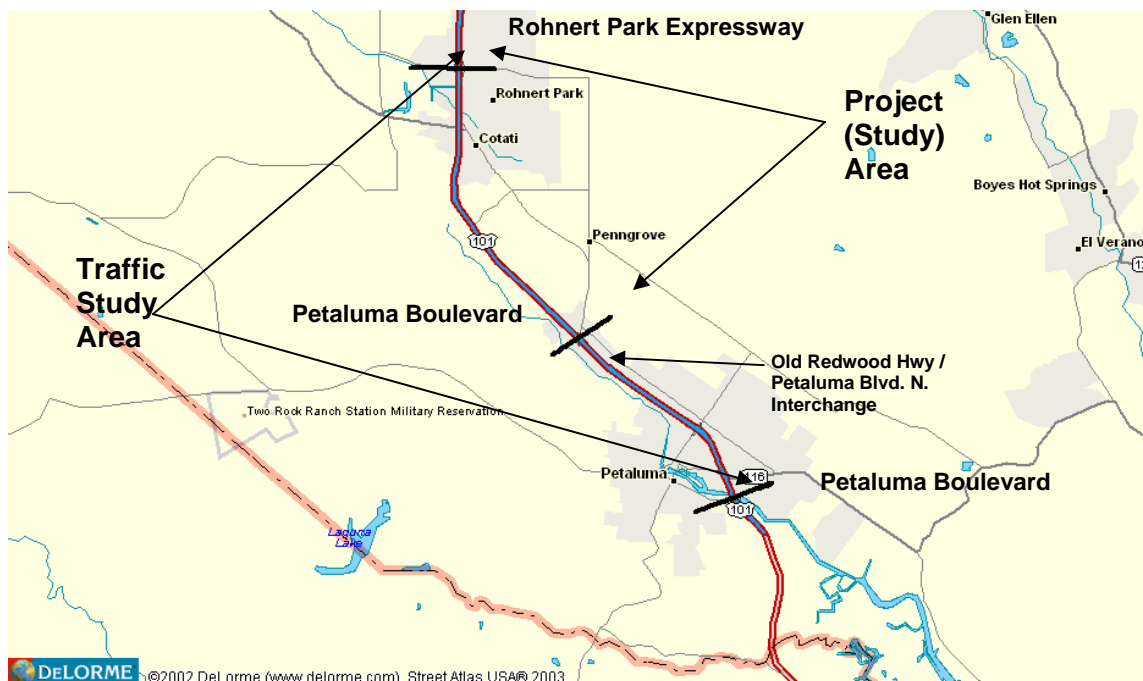


Figure 3.1-3: Traffic Study Area

Current peak-hour travel times on Highway 101 through the traffic study area vary from 11.4 to 18.0 minutes, depending upon the direction and peak hour (morning or evening).

Intersection Analysis

The intersections in the study area are categorized into two groups: signalized (controlled by traffic signals) and unsignalized (controlled by stop signs). SYNCHRO software was used to analyze both kinds of intersections for this study. Based on the operational characteristics of each intersection—mainly the per vehicle delay at each intersection—the intersections were assigned a level of service ranking from LOS “A” to LOS “F”. Level of Service or LOS is a measure used to rate roadway facilities, based on their traffic conditions. The level of service criteria for intersection analysis is presented in Table 3.1-1.

The 11 intersections in the study area are listed below. All these intersections except the Pepper Road/Stony Point Road Intersection are Highway 101 ramp intersections with local streets. Only three of the 11 intersections are unsignalized intersections.

1. Old Redwood Highway and 101 northbound
2. Petaluma Boulevard North and 101 southbound
3. Pepper Road and Stony Point Road
4. West Railroad Avenue and 101 northbound (unsignalized)
5. West Sierra Avenue and 101 northbound (unsignalized)
6. West Sierra Avenue and 101 southbound (unsignalized)
7. SR 116 (West) and 101 northbound
8. SR 116 (West) and 101 southbound
9. Commerce Boulevard and 101 northbound
10. Rohnert Park Expressway and 101 northbound
11. Rohnert Park Expressway and 101 southbound

Table 3.1-1: Intersection LOS Definitions

Level of Service (LOS)	General Description	Criteria for Intersections (control delay per vehicle, sec/veh)	
		Unsignalized	Signalized
A	Traffic flows with very little delay and speeds are optimal. Most vehicles do not stop at all.	0-10	< 10
B	Traffic flows with very little delay and speeds may be slightly reduced. Very infrequent and short waits at traffic signals. More vehicles stop at intersections than for LOS A.	> 10-15	> 10-20
C	Traffic speeds continue to slow. Some vehicles may stop at this level, although many vehicles still pass through the intersection without stopping.	> 15-25	> 20-35
D	Congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines.	> 25-35	> 35-55
E	Low speeds and traffic back ups at intersections. Often considered to be the limit of acceptable delay.	> 35-50	> 55-80
F	Very slow speeds and congestion. Long traffic backups. Very likely to wait for multiple greens to get through an intersection. This is considered to be unacceptable to most drivers.	> 50	> 80

Source: Highway Capacity Manual

The results of the intersection analysis show that all of the 11 intersections are operating at LOS D or better for both the morning and evening peak hours. During the morning peak hour, all intersections operate at LOS C or better, with eight intersections operating at LOS B or better. In the evening peak hour, the Rohnert Park Expressway / Highway 101 (southbound) ramp intersection operates at LOS D. All other intersections operate at LOS C or better. See Table H-3 in Appendix H for more details.

Safety

Accident data for a three-year period from October 1, 2001 to September 30, 2004, the latest three-year period available at the time of the study, were reviewed for both mainline and ramps within the project limits. These data were compared to statewide accident averages for similar facilities. This section summarizes the mainline accidents, actual accident rates, and statewide average rates for the northbound and southbound travel directions within the study area. In both northbound and southbound directions, all but one segment within the project limits had total and injury accident rates near or below the reported average rates for similar facilities.

Highway 101 between the Pepper Road and West Railroad Avenue interchanges was the only segment that had accident rates exceeding statewide average rates for similar facilities. In the southbound direction, the injury and total accident rates were approximately 33 and 39 percent above average rates, respectively. In this same segment in the northbound direction, rates were below average for injury accidents and only slightly above the reported average rates for total accidents.

In both directions along this segment of the highway, and for the project limits as a whole, most of the accidents involved rear-end collisions and hit objects, attributed primarily to speeding, following too close and improper turns. See Figure 3.1-4 and Figure 3.1-5. Weather or unusual roadway conditions did not appear to have contributed significantly to the accident rates in this segment.

One fatal accident was reported on the freeway mainline within the three-year period. This occurred in the southbound direction just south of the Pepper Road on-ramp.

No fatal accidents at ramp locations were reported for this study section during the three-year period. In the southbound direction, accident rates exceed statewide average rates at two locations: the on-ramp from Petaluma Boulevard North, and the on-ramp from Rohnert Park Expressway.

The southbound on-ramp from eastbound Petaluma Boulevard North/Old Redwood Highway had total and injury accident rates over five times and four times reported average rates, respectively. Eighty-five percent of the accidents (six out of seven accidents) were broadside or sideswipe accidents within the ramp/intersection area, primarily due to failure to yield, improper turns or speeding.

The southbound on-ramp from Rohnert Park Expressway had accident rates approximately twice the reported statewide average rates. The majority of accidents (seventy-three percent) were rear end collisions, with sideswipes accounting for a further thirteen percent. These accidents were primarily the result of speeding, following too close or other violations. Ninety-three percent (fourteen out of fifteen) of the accidents occurred at the street intersection.

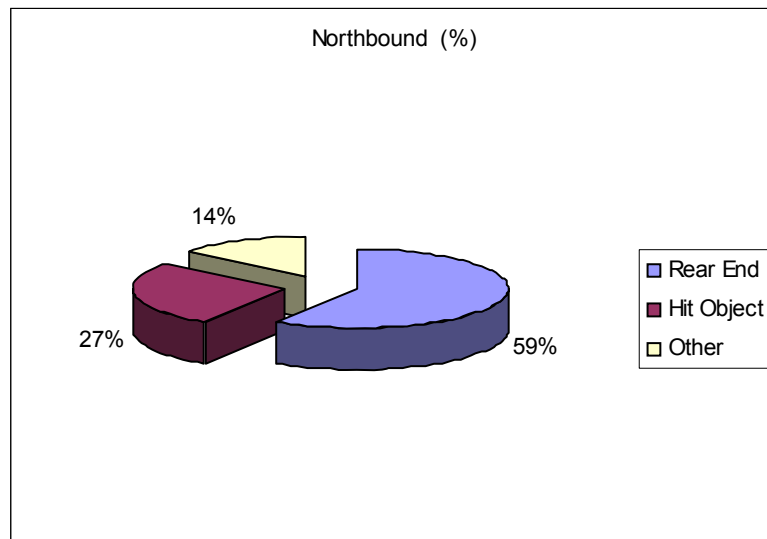


Figure 3.1-4: Percentages of Accidents in the Study Area (Northbound) by Collision Type

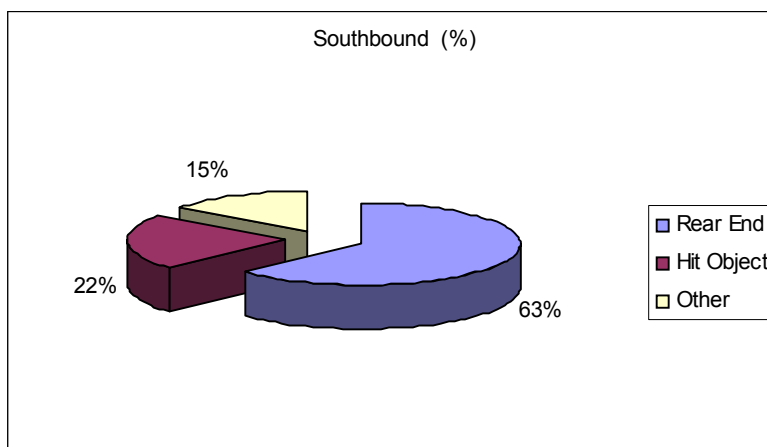


Figure 3.1-5: Percentages of Accidents in the Study Area (Southbound) by Collision Type

In the northbound direction, two of the three on-ramps within the project limits had accident rates exceeding average. At the northbound on-ramp from westbound Petaluma Boulevard, four of the five reported accidents occurred at the intersection with the local street and were primarily rear-end collisions. At the northbound on-ramp from SR 116, the injury accident rate was approximately twice the statewide average, while the total accident rate was approximately 35 percent above average. Four of the total of nine accidents occurred at the intersection with the local street. The types of collision were evenly distributed among sideswipe, rear end, hit object, and overturn. Fifty-six percent of the accidents were due to improper turns.

Accident rates for the northbound off-ramps exceeded statewide average rates at Petaluma Boulevard North/Old Redwood Highway, West Railroad Avenue, and Rohnert Park Expressway. At Petaluma

Boulevard North, eighteen accidents were reported involving a range of collision types. There are no clear trends for collision factors. Although the accident rate at West Railroad Avenue exceeds the statewide average, there were only two accidents reported there, both of which occurred in the intersection area.

At the northbound off-ramp to Rohnert Park Expressway, the injury and total accident rates were more than three times and six times the reported statewide average rates, respectively. There were a total of 73 accidents at this location, 82 percent of which occurred at the ramp intersection. Sixty-six percent were categorized as broadside accidents and 21 percent were rear end collisions. The high percentage of broadside collisions are likely attributable to the addition of a signal at the ramp terminus, during a recent conversion of the interchange from a diamond interchange to a partial cloverleaf configuration.

3.1.1.3 EXISTING TRANSIT, BICYCLE/PEDESTRIAN, AND PARKING CONDITIONS

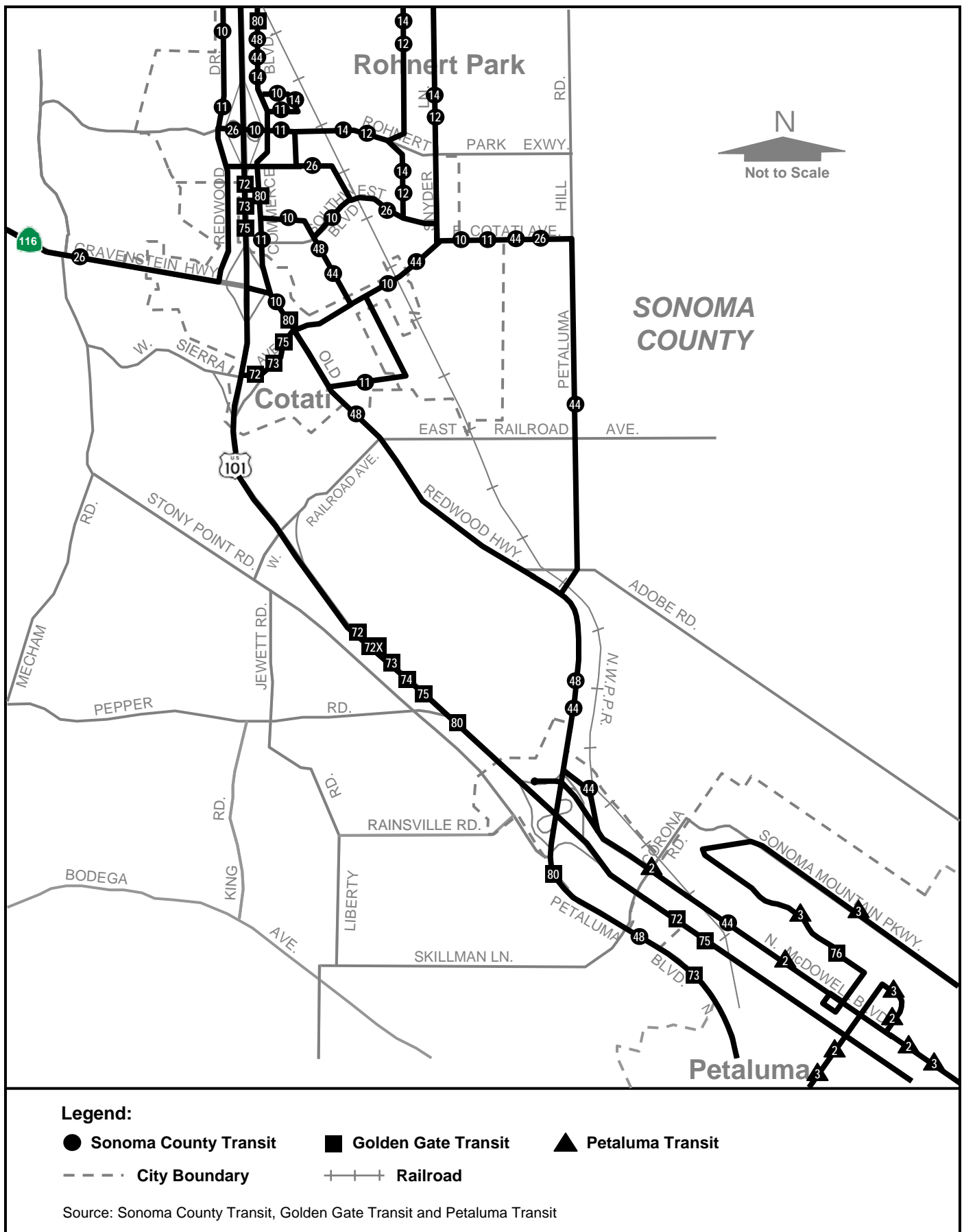
Transit Services

Transit services in the traffic study area are provided by Sonoma County Transit, Golden Gate Transit, and Petaluma Transit. Bus routes in the vicinity of the traffic study area are shown in Figure 3.1-6

- **Sonoma County Transit.** Sonoma County Transit operates a total of 24 bus routes, including six local and three express routes throughout Sonoma County. Coverage of the seven bus routes in the study area includes Rohnert Park City Hall, Rohnert Park Library, El Camino High School, and Mountain Shadows Middle School.
- **Golden Gate Transit.** Golden Gate Transit's 52 bus routes serve cities in Marin County and parts of Sonoma, San Francisco and Contra Costa counties, including the cities of Petaluma, Cotati and Rohnert Park. *Seven* bus routes serve the study area between Petaluma and Rohnert Park, mostly traveling along Highway 101.
- **Petaluma Transit.** Petaluma Transit operates four bus routes for the City of Petaluma, one of which operates within the southern portion of the study area along McDowell Boulevard in Petaluma.

Pedestrian Facilities

According to the Sonoma County Transportation and Land Use Coalition, the number of people who commute by bicycling or walking in Sonoma County is low. In 2003, bikes were used for only about 1.7 percent of commute trips, while the percentage of commute trips made by walking was 3.1. Major pedestrian activity centers within half a mile of the interchanges in the study area are shown in Figure 3.1-7. These activity centers include houses of worship, schools, colleges, governmental facilities, and shopping centers. Walkways and cross paths are provided on many streets near the interchanges, but these facilities are not continuous on all streets. All the interchanges in the study area except at Railroad Avenue and the Highway 101/SR 116 Interchange have pedestrian walkways at the interchange overcrossing or undercrossing.



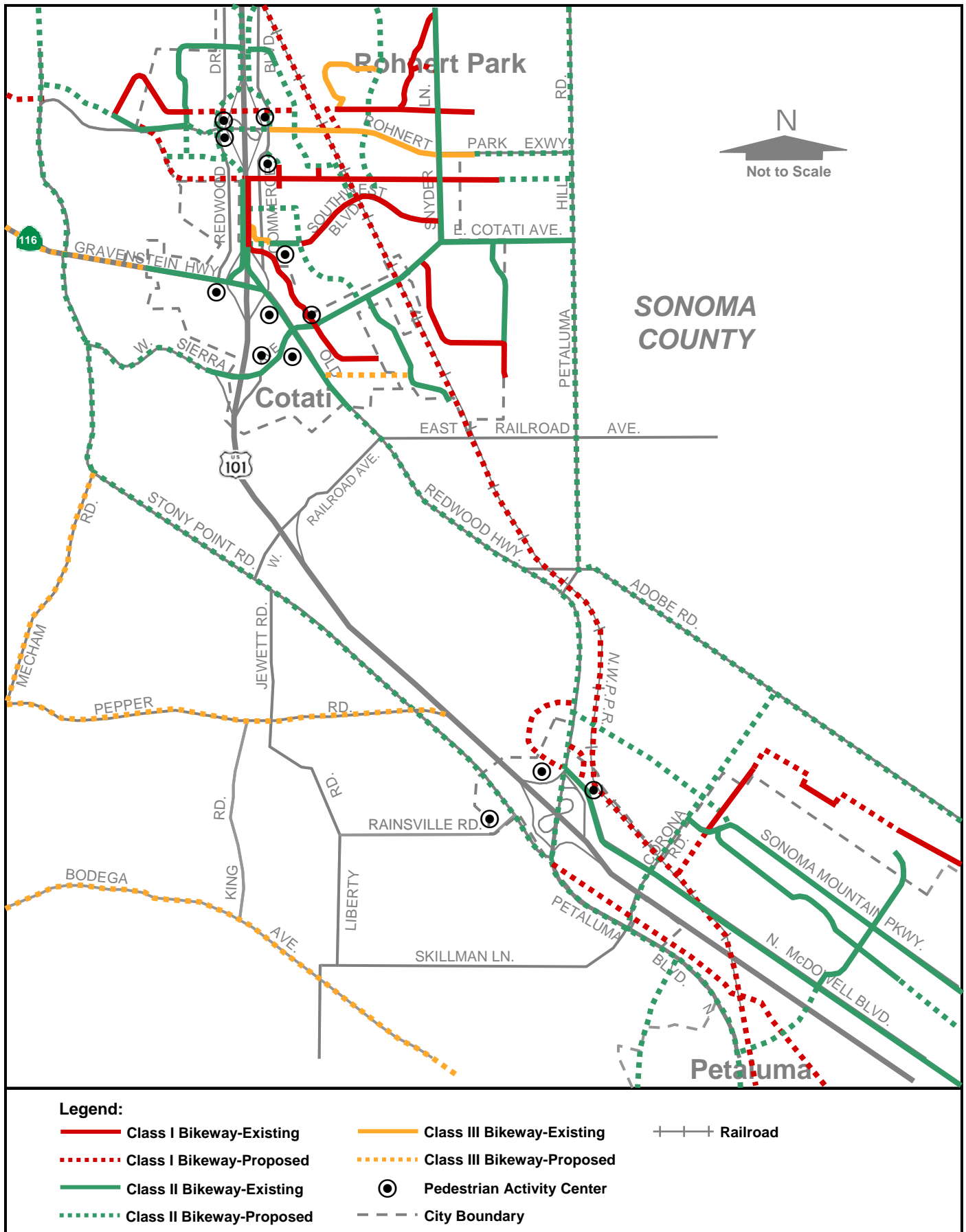
Bicycle Facilities

The *Sonoma County Transportation Authority (SCTA) Countywide Bicycle Plan Update* is the countywide planning document for bicycle facilities. The primary goal of the plan is to create a countywide non-motorized transportation system that provides safe and efficient opportunities for bicyclists to access school, work, shopping centers, professional services, and transportation to recreation areas. Bicycle facilities may also serve as recreational paths themselves. Currently there are over 53 km (33 mi) of off-road (Class I) bike paths and 103 km (64 mi) of on-street (Class II) bike lanes in Sonoma County. Bikeway classifications are defined in Table 3.1-2, below.

Table 3.1-2: Bikeway Classifications	
Bikeway Class	Definition
Class I Bikeway (Bike Path)	Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow minimized.
Class II Bikeway (Bike Lane)	Provides a striped land for one-way bike travel on a street or highway.
Class III Bikeway (Bike Route)	Provides for shared use with pedestrian or motor vehicle traffic.
Source: Caltrans Highway Design Manual, July 1995.	

Existing and planned bicycle facilities in the study area are shown in Figure 3.1-7. Class I bike paths in the study area include the Laguna de Santa Rosa and Marsh Way bike paths in the Rohnert Park and Cotati areas, and the Southwest Boulevard and Copeland Creek bike paths in Rohnert Park. There are several Class II bikeways in the study area, including those on Old Redwood Highway, East Cotati-West Sierra Avenue, and Redwood Drive near Highway 101, from Copeland Creek to Gravenstein Highway in Cotati. The Highway 101/West Sierra Avenue intersection currently has an on-street bikeway facility (Class II) at the undercrossing.

Proposed bikeway facilities (by others) in the study area include a Class I bike path on Commerce Boulevard in Rohnert Park, between Rohnert Park Expressway and State Farm Drive, and Class II and III bikeway facilities on Highway 116, between Cotati and Sebastopol. *Sufficient pavement width will be provided for Class II bike lanes. However, the designation as bike lanes will occur only if the new pavement is contiguous with bike lanes beyond the project limits.*



Parking

A total of about 945 parking spaces are available at locations adjacent to Highway 101 along the study corridor, including shopping centers, industrial complexes, commercial establishments and two park-and-ride lots. Table 3.1-3 summarizes current off-street parking in the project vicinity that has some potential to be affected by the proposed project.

Table 3.1-3: Potentially Affected Parking in the Study Area	
Location	Total Parking Spaces¹
Cattleman's Restaurant	210
Quality Inn	110
Crikos Trucking Company	40
Park-and-Ride Lot (Cotati–Old Redwood Highway and St. Joseph Way)	180
Showcase of Motorcars	80
Sonoma Joe's Casino and Restaurant	130
Park-and-Ride Lot (Rohnert Park–U.S. 101 and Rohnert Park Expressway)	110
Redwood Reliance Sales	85
Total	945
¹ Estimate of existing parking based on a review of aerial mapping. Source: Parsons 2004	

3.1.2 Environmental Consequences

The following sections report anticipated traffic and transportation effects of the No-Build and Build Alternatives. See the *Revised Draft Traffic Operational Analysis–Traffic Operational Memorandum*, for information on the travel demand modeling and operational analysis, including data on freeway level of service, queues, and bottlenecks, which are not included in this section. The Build Alternative is the proposed Highway 101 HOV Lane Widening Project. The No-Build Alternative includes all currently planned and/or programmed improvements except the proposed project. The No-Build Alternative therefore assumes that the Marin/Sonoma Narrows, Steele Lane to Windsor River Road, Rohnert Park Expressway to Santa Rosa Avenue, including Wilfred Avenue Interchange, and Highway 12 to Steele Lane HOV Lane widening projects (depicted in Figure 1.1-3 and discussed in Section 1.3.3, Related Projects) would all be in place by 2030. The Build Alternative (*Preferred Alternative*) analysis evaluates the effects of the present project in addition to No-Build conditions.

3.1.2.1 2030 PEAK HOUR TRAFFIC CONDITIONS UNDER THE NO-BUILD ALTERNATIVE

In 2030, the annual average daily traffic (AADT), along the Highway 101 study corridor would range from 109,000 to 133,000 vehicles per day (both directions), as shown in Figure 3.1-8. By 2030, without capacity and operational improvements on Highway 101, traffic conditions on the freeway

and at the intersections near the freeway would deteriorate. The percentage of peak-hour travel demand that could be accommodated by the freeway through the study area would decrease, leading to lower travel speeds, greater travel times, and delays.

Low levels of Service (LOS) for mainline segments in the traffic study area show congested traffic conditions which would disrupt traffic flow. LOS is a measure used to rate roadway facilities, based on their traffic conditions. It ranges from LOS A, free-flow conditions with no congestion, to LOS F, stop-and-go conditions. Under the No-Build Alternative, the LOS for mainline segments would vary from LOS B to LOS F, depending on direction and peak hour. Several sections would operate at LOS F indicating stop-and-go conditions or even total breakdown.

The following paragraphs describe the projected mainline and intersection operating conditions under the No-Build Alternative. See Tables H-4 and H-5 in Appendix H for detailed tabulations of the information presented in the following paragraphs.

Travel Time

Congestion creates increased travel times through the 11.7-mile traffic study area, compared with 'free-flow' (no delay) travel time of 10.8 minutes. Without capacity and operational improvements on Highway 101, travel times through the traffic study area in 2030 would vary from 17.0 to 24.8 minutes for mixed-flow lane users and 17.0 to 19.6 minutes for HOV lane eligible users, based on direction and peak hour (Table 3.1-4). Travel times would be highest in the northbound direction, amounting to 22.4 and 24.8 minutes for mixed-flow lanes and 19.2 to 19.6 for HOV lane eligible users in the morning and evening peak hours, respectively. Travel times in southbound direction would be somewhat better, about 18.4 and 17.0 minutes respectively, in the morning and evening peak hours, for both mixed-flow lane users and HOV lane eligible users.

Table 3.1-4: Estimated Travel Time, Delay, and Time Savings in 2030 (minutes)

Alternative	Southbound				Northbound			
	AM		PM		AM		PM	
	M-Flow	HOV	M-Flow	HOV	M-Flow	HOV	M-Flow	HOV
Travel Time								
No Build	18.4	18.4	17.0	17.0	22.4	19.2	24.8	19.6
Build	11.8	11.8	11.8	11.8	16.6	11.9	14.4	12.0
Savings	6.6	6.5	5.3	5.2	5.8	7.3	10.4	7.6
Delay								
No Build	7.6	7.6	5.8	5.8	11.3	8.2	13.7	8.5
Build	0.9	1.0*	0.9	1.0*	5.6	1.0	3.4	1.0
Savings	6.6	6.6	4.9	4.8	5.7	7.2	10.3	7.5

* Increases in southbound HOV delay, when compared to mixed-flow delay, range from 1 to 3 seconds and are not substantial. The HOV lanes provide enough added southbound capacity to prevent congestion from developing.

Note: Numbers might not add up due to rounding.

Source: Parsons 2005.

Delay

Increasing traffic demand and decreasing speeds translate into delay. See Figure 1.2-2 for delay locations. The location of worst delays and lowest speeds in the project area in 2030 is projected to be from the East Washington Street on-ramp to the top of the Cotati Grade, which ends just before the West Sierra Avenue off-ramp. This congested condition appears to result from a combination of merge problems at the Old Redwood Highway-Petaluma Boulevard North Interchange and the three percent grade, which reduces the effective capacity of the freeway in this segment. As shown by Table 3.1-4, delay would be highest in the northbound direction, amounting to 11.3 and 13.7 minutes for mixed-flow lane users and 8.2 to 8.5 minutes for HOV lane eligible users in the morning and evening peak hours, respectively. The delay in the southbound direction would be 7.6 and 5.8 minutes respectively, in the morning and evening peak hours, for both mixed-flow lane users and HOV lane eligible users.

Intersection Analysis

Intersection geometry within the project limits under the No-Build Alternative would remain the same as the existing intersection geometry. Details of intersection analysis results are presented in Table H-6 in Appendix H. Under no-build conditions in 2030, all intersections would operate at LOS D or better except at the following locations:

- Petaluma Boulevard North and Highway 101 southbound off/on-ramp
- West Sierra Avenue and Highway 101 southbound on-ramp
- *SR 116 (West) and Redwood Drive*
- SR 116 (West) and Highway 101 southbound on/off ramps
- *SR 116 (West) and Old Redwood Highway*
- Old Redwood Highway and Commerce Boulevard-SR-116 northbound on-ramp

The Petaluma Boulevard North and Highway 101 southbound off/on-ramp would operate at LOS E during the morning peak hour. *The SR 116 (West) and Redwood Drive intersection would operate at LOS F during the evening peak hour.* The SR 116 (West) and Highway 101 southbound on/off ramps would operate at LOS F during the evening peak hour. *The SR 116 (West) and Old Redwood Highway intersection would operate at LOS E during the morning peak hour and LOS F during the evening peak hour.* The remaining two intersections would operate at LOS F during both the morning and evening peak hours.

3.1.2.2 2030 TRANSIT CONDITIONS UNDER THE NO-BUILD ALTERNATIVE

Without the proposed HOV lane widening and related improvements, peak-period transit operations within the traffic study area would experience similar congestion and delay conditions as described for no-build traffic operations in 2030. Problem locations along the freeway mainline and at intersections would be as described in Section 3.1.2.1, 2030 Peak Hour Traffic Conditions under the No-Build Alternative.

3.1.2.3 BICYCLE/PEDESTRIAN AND PARKING CONDITIONS UNDER THE NO-BUILD ALTERNATIVE

No substantial adverse impacts to bicycle, pedestrian, and parking conditions within the Highway 101 HOV Lane Widening Project area are anticipated as a result of the No-Build Alternative.

3.1.2.4 2010 PEAK HOUR TRAFFIC CONDITIONS UNDER THE NO-BUILD AND BUILD ALTERNATIVES

The Build Alternative is anticipated to operate at acceptable levels of service in 2010 and would operate better than the No-Build Alternative. Heavy growth within the Highway 101 corridor occurs between 2003 and 2010, increasing traffic volumes within the project limits between 7 and 72 percent depending upon direction and peak hour. The Build Alternative would reduce congestion substantially in the following locations:

- Old Redwood Highway-Petaluma Boulevard North to Railroad Avenue in the northbound direction in the morning peak hour;
- Old Redwood Highway-Petaluma Boulevard North to West Sierra Avenue in the northbound direction in the evening peak hour; and
- Pepper Road to Rohnert Park Expressway in the southbound direction in the morning and evening peak hours.

Congested conditions would develop in the southbound direction approaching Petaluma Boulevard South in both the morning and evening peak hours under both the Build and No-Build alternatives because the “Narrows” section south of Petaluma Boulevard South is constrained.

Under the Build Alternative (*Preferred Alternative*), the HOV lanes provide enough added capacity within the project limits to substantially reduce the northbound and southbound congestion on Cotati Grade. Reduction of congestion at these locations, especially the locations on southbound Highway 101, results in substantial reduction in delay for both HOV and mixed-flow lane users when compared to the No-Build Alternative.

3.1.2.5 2030 PEAK HOUR TRAFFIC CONDITIONS UNDER THE BUILD ALTERNATIVE (PREFERRED ALTERNATIVE)

The Build Alternative (*Preferred Alternative*) would widen the Highway 101 median to provide HOV lanes in each direction and widen the outside of the highway to provide standard shoulders. Auxiliary lanes would be added between the SR 116 (Gravenstein Highway) and Rohnert Park Expressway ramps to improve operations as traffic enters and exits Highway 101 from those interchanges. A climbing lane in the northbound direction between Old Redwood Highway and West Sierra Avenue to separate slow-moving vehicles from faster-moving traffic up the Cotati Grade *is also included*.

The average annual traffic demand in the traffic study area in 2030 would range from 109,000 to 133,000 vehicles per day (both directions), as shown in Figure 3.1-8. With capacity improvements,

the freeway would be able to serve the projected demand more efficiently than under the No-Build Alternative. Under the Build Alternative (Preferred Alternative), the HOV Lanes would operate at LOS C or better for all directions and peak hours. Adding HOV lanes would not remove all the congestion-related problems in the study area. Even with improved capacity, mixed-flow lane users would still encounter some level of congestion. In the northbound direction, the LOS for mixed-flow lanes would vary between LOS C and LOS F for both peak hours. In the southbound direction, it varies from LOS C to LOS E during morning peak hour and between LOS C and LOS D during evening peak hour.

While the new facilities added under the Build Alternative would substantially improve traffic operations on Highway 101, especially in the near term, the Build Alternative (Preferred Alternative) would not eliminate all of the operational problems that would occur in the study area by 2030.

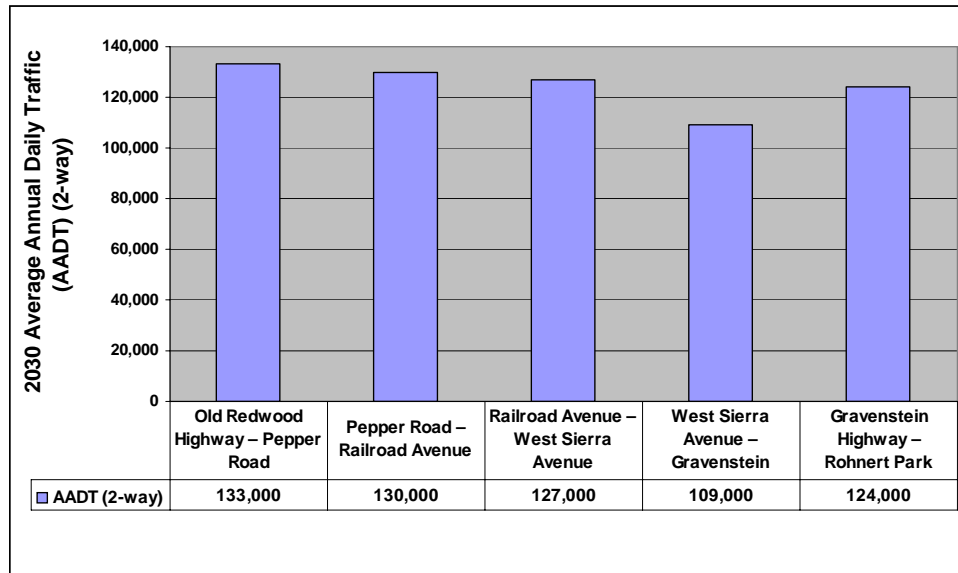


Figure 3.1-8: Estimated 2030 Annual Average Daily Traffic Volumes on Highway 101

Applicable Traffic and Parking Impact Standards

The County's criteria for determining traffic impacts are as follows:

- **Vehicle Queues:** The 95th percentile queue length exceeds the turn lane storage capacity;
- **Signal Warrants:** Conditions change to cause an intersection to meet or exceed Caltrans signal warrant criteria;
- **Turn Lanes:** Traffic volumes increase to a level that meets or exceeds warrants for providing a turn lane on an intersection approach.
- **Sight Distance:** An intersection is created or traffic is added to an existing intersection approach that has inadequate sight distance based on Caltrans criteria;

- **County Signalized Intersection:** A signalized intersection is projected to operate at LOS “E” or “F” as a result of the project or an intersection that would otherwise operate at LOS “E” or “F” and the project results in increased delay of 7.5 seconds or more (LOS “E”) or 5.0 seconds or more (LOS “F”).
- **County Unsignalized Intersections:** An un-signalized or all-way stop controlled intersection as a result of the project or an intersection that would otherwise operate at LOS “E” or “F” is projected to operate at LOS “E” or “F” and the project results in increased delay of five seconds or more, except that this criteria does not apply to low volume roadways.
- **Parking.** For restaurant parking, one space is required for every 2.5 seats. Reduction below this minimum standard could constitute an impact.

The Build Alternative (*Preferred Alternative*) would generally improve traffic operations on Highway 101 in the traffic study area. Although the Build Alternative (*Preferred Alternative*) would improve traffic operations for both mixed-flow and HOV lane vehicles, operational improvements would be much greater for the HOV lane traffic, which would operate at or near free flow speeds, even during peak hours. As shown in the following paragraphs, the proposed project would enhance the ability of Highway 101 to improve travel speeds and shorten travel times. See Tables H-4 and H-5 in Appendix H for detailed tabulations of the information presented in the following paragraphs. These paragraphs discuss the effects of the improvements separately for both the HOV lanes and mixed-flow lanes. The delay savings subsection below also presents the reduction in delay for the mixed flow lanes.

Travel Time

Under the Build Alternative (*Preferred Alternative*), as shown in Table 3.1-4 and Figure 3.1-9, the travel time through the traffic study area would shorten to between 11.8 and 16.6 minutes, depending on the direction and peak hour. In comparison, travel times through the traffic study area under no-build conditions would vary between 17.0 and 24.8 minutes for mixed-flow lane users and 17.0 and 19.6 for HOV lane eligible users. This translates to a 26 to 42 percent reduction in travel times for mixed-flow users and a 31 to 39 percent reduction for HOV lane users.

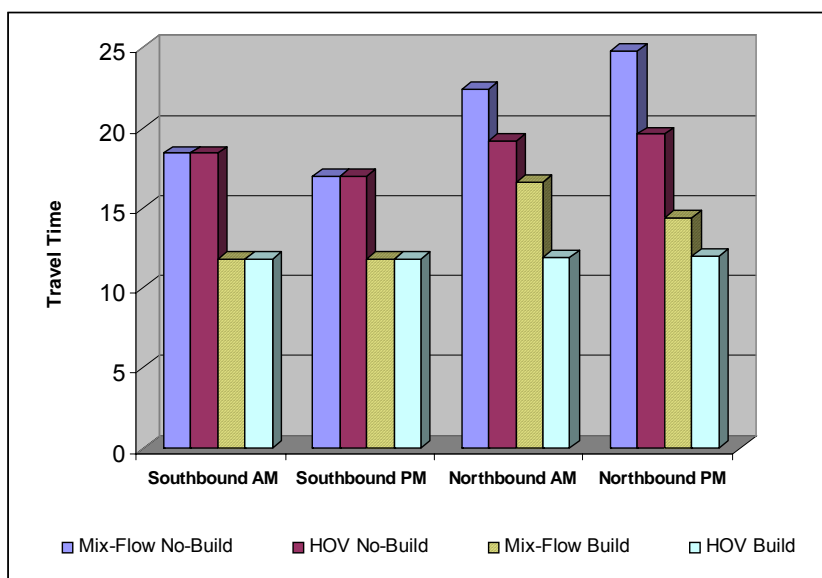


Figure 3.1-9: Travel Times through Traffic Study Area under Build and No-Build Alternatives

Average travel time in the HOV lanes in the traffic study area under the Build Alternative (*Preferred Alternative*) would be 12 minutes for both peak hours and directions. Thus, the potential travel time savings for a motorist who switches from driving in a mixed-flow lane (drive-alone) to an HOV lane (carpool of two or more) under the Build Alternative would be as much as five minutes within the traffic study area. Maximum HOV time savings in the entire corridor from Windsor to Petaluma, of which this project would be the final segment, would be around 11.5 minutes.

The potential travel time savings for a motorist who switches from driving in a mixed-flow lane under the No-Build to the HOV lane under the Build Alternative would vary between five and 13 minutes.

Delay

Figure 3.1-10 shows the total delay within the traffic study area for both alternatives. The shaded areas in the graph show locations of traffic congestion. The Build Alternative would reduce peak-hour delay at some congested locations by over 90 percent. It would reduce delay for mixed-flow lane motorists in the traffic study area by 4.9 to 10.3 minutes, a 51 to 87 percent reduction. HOV users would experience a delay reduction from 4.8 to 7.5 minutes, or 83 to 88 percent, depending on the peak hour and direction (Table 3.1-4).

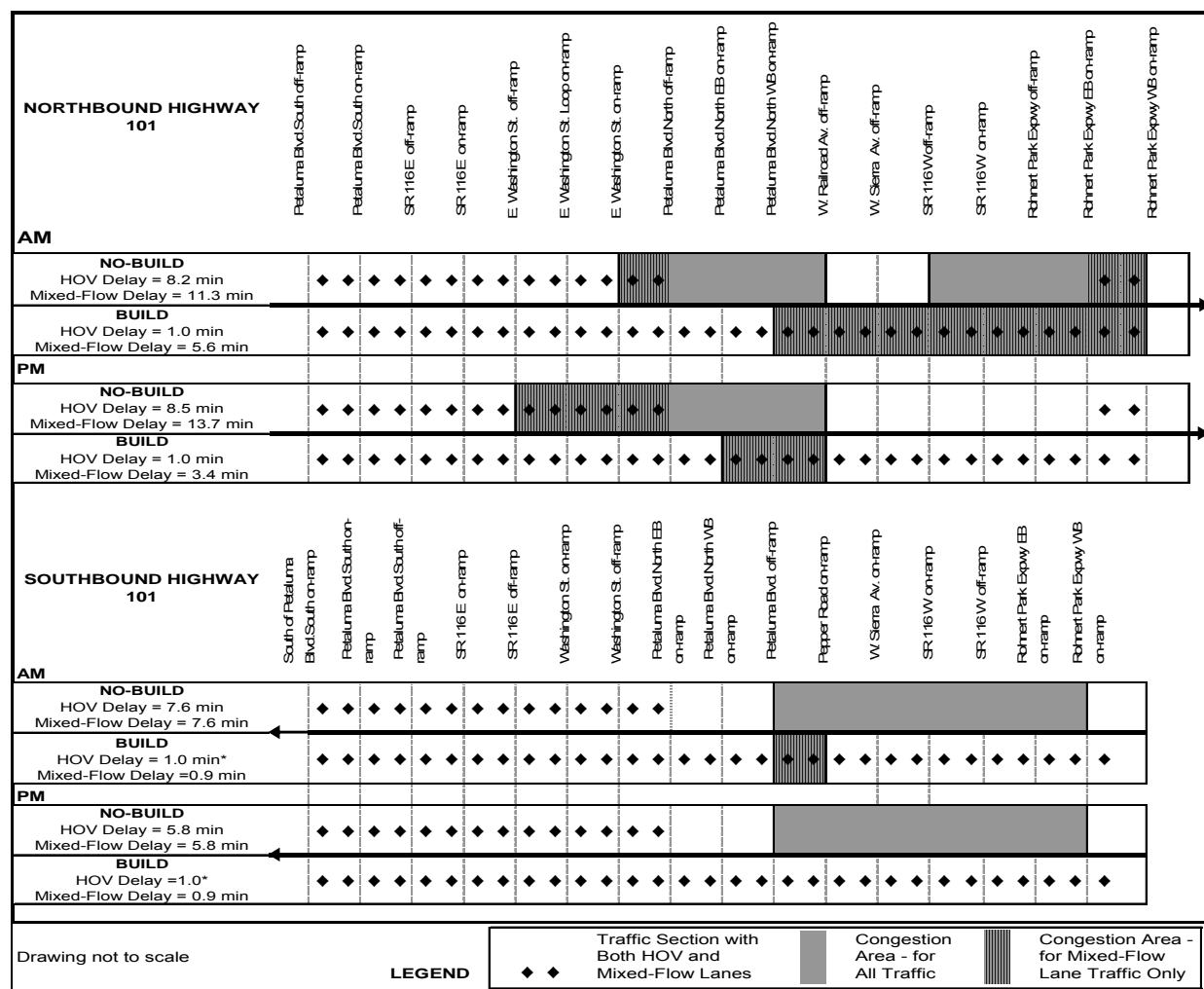


Figure 3.1-10: Total Delay and Locations of Traffic Congestion within Traffic Study Area under Build and No-Build Alternatives in 2030

- Note:
- HOV lanes shown outside the proposed project limits under the No-Build Alternative are those created by the related projects described in Section 1.3.3, Related Projects
 - *Under the Build Alternative, increases in southbound HOV delay (when compared to mixed-flow delay), range from 1 to 3 seconds and are not material. The HOV lanes provide enough added southbound capacity to prevent congestion from developing.)

The location of the worst delays was projected to be from the East Washington Street on-ramp to the top of the Cotati Grade, which ends just before the West Sierra Avenue off-ramp. Construction of the HOV lane, interchange ramp improvements at Petaluma Boulevard North, and a climbing lane on the Cotati Grade would result in an 88 to 91 percent reduction in delay for HOV lane users and a 79 to 91 percent reduction in delay for mixed-flow motorists at this location.

Effect of Climbing Lane on Cotati Grade

Between the Petaluma Boulevard North off-ramp and the top of the Cotati Grade just before West Sierra Avenue, there would be a 26 percent improvement in the ability to meet future demand in the

evening northbound direction and a 14 percent increase in the morning northbound direction. The ability to serve more traffic under the Build Alternative (Preferred Alternative) would be due to the ramp improvements at the Old Redwood Highway-Petaluma Boulevard North Interchange, and the new climbing lane on Cotati Grade, in addition to the HOV lane. It is anticipated that buses will be able to maintain adequate speeds on the Cotati Grade to permit their use of the HOV lane between Petaluma Boulevard North and West Sierra Avenue. The congestion and delay at this location would be considerably reduced during the morning and evening peak hours. (See the section above, 'Travel Speeds', for further discussion of delay on Northbound Highway 101.)

The Build Alternative (Preferred Alternative) analysis shows that the addition of an HOV and a climbing lane along Cotati Grade improves operations compared to the No-Build Alternative by reducing the densities, raising travel speed, shortening the congestion from the East Washington Street interchange to the Petaluma Boulevard North Interchange, and reducing travel time and delay more than 7.2 minutes in the morning peak hour. In the Build Alternative (Preferred Alternative), the HOV lanes would operate at uncongested conditions in the morning and evening peak hours. Travel time and delay would be reduced for HOV lane eligible users by 0.8 minutes in the morning peak hour and 1.9 minutes in the evening peak hour compared to mixed-flow travel. Thus a benefit is provided for HOV users while making substantial reductions in delay for mixed-flow users. Operations in the mixed-flow lanes along Cotati Grade, even with a climbing lane and HOV lane, would still reach effective capacity under the Build Alternative, due to the presence of congested conditions outside of the project area.

Intersection Analysis

Under the No-Build Alternative, where intersection geometry within the project limits would be the same as the existing intersection geometry, all but six intersections would operate at LOS D or better. Under the Build Alternative in 2030, all intersections within the project limits would operate at LOS C or better with proposed improvements except the intersection at SR 116 West and Old Redwood Highway, which would operate at LOS D, just over the border between LOS C and D. See Table H-7 in Appendix H for detailed intersection analysis results.

Traffic on Local Streets, VHT, and VMT

Traffic diversions to local streets near congested locations on the freeway are common and can cause considerable delay. By 2030, as congestion on the freeway increases, traffic diversion to local streets, such as Old Redwood Highway, would also increase. This increase in "cut-through" traffic would deteriorate conditions on local streets, increasing delay and energy consumption. The Build Alternative would substantially reduce congestion at some of the congested areas, including the segment between the Old Redwood Highway-Petaluma Boulevard North and Railroad Avenue interchanges, and reduce delay through the traffic study area, providing incentive for commuter and through-traffic to remain on the freeway, freeing arterials and other local streets to serve local traffic.

When there is congestion, vehicles spend more time on a roadway and the vehicle hours of travel (VHT) increase compared to less congested conditions. When vehicles attempt to circumvent freeway congestion by using local roads, the vehicle miles of travel (VMT) increases. Under the Build Alternative, annual countywide VMT would decrease by 31 million kilometers (19 million miles) and annual countywide VHT would decrease by two million hours compared to the No-Build Alternative. These improvements reflect improved travel conditions and a reduction in freeway traffic diversion onto local streets in the traffic study area with the Build Alternative.

3.1.2.6 2030 TRANSIT, BICYCLE/PEDESTRIAN, AND PARKING CONDITIONS UNDER THE BUILD ALTERNATIVE (*PREFERRED ALTERNATIVE*)

Transit and Carpooling Conditions

The HOV lanes provided under the Build Alternative (*Preferred Alternative*) would offer dedicated peak hour capacity and a high level of traffic service to transit and carpool vehicles. This would substantially improve travel times for intercity buses and carpooling commuters, as shown in Table 3.1-4. Not only would transit travel time be reduced but transit schedule reliability would be improved. Carpools and vanpools also would have improved speeds and reduced travel times. The improved speeds and schedule reliability would work as incentives for commuters and other travelers to carpool and/or take advantage of local and express buses that would move freely along the HOV lanes. HOV lanes would support an increase in express bus service from Sonoma County to San Francisco, recommended in the 2002 *HOV Lane Master Plan* (Metropolitan Transportation Commission, 2003), offering faster and more frequent peak-hour transit service for commuters between Sonoma County and downtown San Francisco. *Options for providing bus pads at the Highway 101/116 Interchange will be evaluated in the final design phase and will be incorporated, feasible. Caltrans prefers that bus stops be provided at park-and-ride facilities where these are located close to an interchange, rather than on the ramps. The existing bus pads at the Petaluma Boulevard North/Old Redwood Highway on-ramps are currently not used. Consideration of the bus pad replacements at this location will be deferred to the over crossing widening and replacement project to be sponsored by the City of Petaluma.*

Pedestrian Facilities

It is expected that the safety and accessibility of the Highway 101 corridor and adjacent roadway network for both pedestrians and bicyclists would generally be facilitated by the improvements under the Build Alternative (*Preferred Alternative*). Existing pedestrian activity centers and pedestrian facilities near the study area interchanges are described in Section 3.1.1.3, Pedestrian Facilities. The proposed project would not directly improve existing pedestrian structures in the study area, except at the SR 116/Highway 101 Interchange, where the existing structure would be replaced under Interchange Option B and at the School Street pedestrian undercrossing. *Replacement sidewalk is proposed on SR 116 between Redwood Drive and Old Redwood Highway on the south side and between the southbound off-ramp and Old Redwood Highway on the north side. In addition, the sidewalk on Commerce Boulevard will be replaced where required for roadway and ramp realignment. All replacement sidewalk will meet Americans with Disabilities Act (ADA)*

requirements and include handicap ramps. At the School Street pedestrian undercrossing, modifications to the approach grades, cross slope, surface and clear width will be incorporated into the project to bring the pedestrian undercrossing into compliance with ADA requirements.

At all the other interchanges, the Build Alternative would maintain the existing pedestrian facilities. If the project would affect existing pedestrian facilities, the pedestrian facilities would be replaced and the new facilities would be made ADA compliant. Similarly, if any changes are needed to the local streets that would affect the walkways or crosswalks in the street, the walkways and crosswalks would be replaced. In addition, the project would signalize the West Sierra Avenue–Highway 101 ramp intersections, which would help pedestrian movement.

Another structure to be replaced in the project area, though not near a major interchange, would be the existing Railroad Avenue Undercrossing. At present, this undercrossing does not have any pedestrian walkways. When the new structure is built, room would be provided for future pedestrian walkways to be provided by others.

Bicycle Facilities

It is expected that safety and accessibility for both pedestrian and bicyclists would generally be improved as a result of the improvements under the Build Alternative. The project is not expected to affect existing bike paths, and if any changes are needed, the bike paths would be replaced.

In addition, the project proposes to replace the existing Railroad Avenue Undercrossing. When the new structure is built, a 2.4 m (7.9 ft) wide stretch on either side of the road would be set aside for future bike lanes to be provided by others.

Parking

As reported in Table 3.1-5, it is estimated that 35 parking spaces within the right-of-way would be removed for the Build Alternative. Approximately 14 percent of the parking (30 spaces) would be removed from the Cattlemen's restaurant in the southwest corner of the Highway 101/Old Redwood Highway Interchange. Approximately five parking spaces would be removed from the Sonoma Joe's Casino and Restaurant in the northeast corner of the Highway 101/Old Redwood Highway Interchange. The remaining parking spaces at both establishments would still be above the minimum parking requirements set by the City of Petaluma.

Table 3.1-5: Projected Parking Spaces Removed by Project in the Study Area		
Location	Total Parking Spaces	Projected Spaces Removed
Cattlemen's Restaurant	210	30
Sonoma Joe's Casino and Restaurant	130	5
Total	340	35
Source: Parsons 2005		

3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts on traffic under the Build Alternative (*Preferred Alternative*) would be generally beneficial and therefore no additional project modifications are needed. The proposed project would also not have adverse impacts on pedestrian or bicycle facilities. If pedestrian or bicycle facilities would be displaced or interrupted by project construction, they would be replaced. Also, room would be provided for future pedestrian and bicycle facilities (to be provided by others) when the Railroad Avenue Undercrossing is replaced.

The Build Alternative (*Preferred Alternative*) would reduce parking at Cattlemen's Restaurant and Sonoma Joe's Casino and Restaurant, but not below parking standards of the City of Petaluma. *The owners of these parking spaces would be compensated as required by the Uniform Act. Please see Section 3.4.3.1 for more information on this Act.*